THE CITY OF HAMPTON PUBLIC WORKS DEPARTMENT
STORMWATER OPERATIONS – ENVIRONMENTAL SERVICES
419 NORTH ARMISTEAD AVENUE
HAMPTON, VIRGINIA 23669

Environmental Services Plan

Stormwater Operations
Department of Environmental Services
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1 ~ Introduction and Mission Statement

1.1 Introduction

Bordering the Chesapeake Bay and residing between the Northern Temperate and Southern Tropical zones, the City of Hampton allows residents the best and worst of both environmental worlds. Outdoor hobbies and water activities are some of many benefits bestowed upon this unique area. The City of Hampton and its residents have the responsibility of maintaining the terrestrial and aquatic environments that we all enjoy, from the expansive salt marsh area in the northeast, the rural wooded areas in the northwest and the developed urban areas to the south. Hampton has several watersheds that convey storm water runoff directly to the Chesapeake Bay; which if not managed responsibly, these unique ecosystems can be adversely affected. Organic and inorganic pollution, declining salt and fresh water quality, vector- borne transmitted diseases, and nuisance pest issues are situations that the City of Hampton is forced to address. Fortunately, the City of Hampton's Environmental Services Department is dedicated to protecting and improving our environment for future generations.

1.2 Mission Statement

The mission of Hampton's Environmental Services Department is to insure public health and safety while continuing compliance with federal and state environmental agency mandates as entrusted stewards of/for the city of Hampton's environmental and ecological resources.

2 – Environmental Services Resources

2.1 Personnel

The Environmental Services department employs seven team members. All members maintain current certification through the Virginia Department of Agriculture and Consumer Services (VDACS) in the required category **(8) Public Health Pest Control.** Other categories from VDACS are encouraged as well, but not required: 3-A Ornamental Pest Control, 3-B Turfgrass Pest Control, 5-A Aquatic Pest Control, 6 Right- of -Way Pest Control, 7-A General Pest Control and 9 Regulatory Pest Control Turf.

The Environmental Services Manager is responsible for the Environmental Services Department budgeting, scheduling and direction, insuring compliance with all federal, state and local regulations related to the Environmental Services Department's pesticide applications, assisting the Senior Stormwater Engineer and the Stormwater Superintendent insuring that Hampton's MS4 Stormwater permit responsibilities are achieved; directing the Storm Water Management Facilities (SWMF) inspection process with the goal of meeting the cities Total Maximum Daily Load (TMDL) requirements; creating and implementing all Integrated Pest Management plans.

The Biologist directs all surveillance and laboratory activities. Specialization includes: mosquito speciation, arboviral testing, illicit discharge testing, and SWMF inspection and data entry. The Biologist functions as a liaison between Federal, State and local Vector Control organizations; initiates citizen education through public events and an innovative teaching approach through local schools and technical establishments; serves as a board member to public health and biological organizations and assists the Environmental Services Manager on program direction and success.

The Environmental Services Technician Team consists of five professionals. They implement field larval and adult mosquito surveillance operations, perform all pesticide applications, respond to service requests concerning vertebrate and non-vertebrate pests, conduct SWMF field inspections and assist with Illicit Discharge Screening. All team members possess a strong commitment for the safety of the citizens of Hampton and its environment.

2.2 Facilities

The Department of Environmental Services maintains three separate facilities. Offices and laboratory are located in the Environmental Services Base office behind the Storm Water Operations office at 419 N. Armistead Avenue. The Pesticide Storage building is located at the same address within the Public Works compound. The equipment storage and maintenance facility is located at 701 N. Armistead Avenue.

2.3 Mosquito Control Hotline

In the event that Adult Mosquito Control is implemented, the City of Hampton has two methods of contact for daily information regarding what locations are being treated. The main point of contact is the Mosquito Control Hotline (757-727-8415). This hotline gives the date, approximate time and the communities that are scheduled for treatment. It is updated regularly during spray season and directs callers to the alternative contact method, dialing 311 for additional questions or concerns which the hotline does not address.

3 – Environmental Services Responsibilities

3.1 Pest Control Operations

Pest control operations are divided into four separate categories: Mosquito Control, Aquatic Weed Control, Rodent Control, and General Pest Control.

A. Mosquito Control

Environmental Services Department provides mosquito control services to residents and visitors of Hampton through an Integrated Mosquito Management Plan. This plan takes a proactive approach to educate the public and utilizes environmentally sound measures to reduce or eliminate mosquito populations before they become a health risk or major nuisance.

In response to surveillance traps and service requests, mosquito control teams employ source reduction with pesticide use while maintaining and promoting a healthy environment for other aquatic invertebrates which act as biological controls for mosquitoes.

Environmental Services currently utilizes a rapid screening test (VecTest) to detect West Nile Virus (WNV) and Eastern Equine Encephalitis (EEE) in local mosquito populations. Positive test results are forwarded to the Pennsylvania Department of Environmental Protection for confirmation.

• See Appendix A

B. Aquatic Weed Control

The Environmental Services Department assists the Storm Water Maintenance Division with Aquatic Weed Control in city rights-of-way, vegetative ditches, and municipality owned properties. Aquatic herbicide treatments are used for the control of vegetative growth when the areas are inaccessible to machinery or pose safety issues for employees. This process is also used when other maintenance practices exceed cost-efficacy.

• See Appendix B

3.1 Pest Control Operations (cont.)

C. Rodent Control

When Environmental Services receives rodent complaints from citizens through the 311 Call Center, the area is inspected and treatment measures are employed. If the problem is located on private property, team members advise the resident of safe and environmentally sensitive ways to eliminate rodent pests.

Muskrats and Nutria are well established in Hampton. The Environmental Services Department does not utilize any control methods for muskrats and will only address 311 requests in an advisory capacity. Control is regulated in Virginia during designated times of the year. Residents are directed to the Department of Game and Inland Fisheries for further information.

D. General Pest Control

Environmental Services Team members stay up to date on all aspects of pest control and will provide citizens and visitors of Hampton with basic information about other vertebrate and non-vertebrate pest control.

3.2 Newmarket Creek Inspection

The Department of Environmental Services conducts a quarterly inspection of the Newmarket Creek to remove obstructions of flow from the Newport News city line to Blue Bird Gap Farm. An annual inspection is performed from the Blue Bird Gap Farm to the Chesapeake Bay to insure no major blockages have occurred during the year. After major storm events, additional inspections may occur to access damage.

Other tributaries and estuaries within the City of Hampton are inspected and cleared as time permits.

3.3 Storm Water Management Facilities Inspection

The current MS4 permit established by the City of Hampton and the EPA requires the annual inspection of public and private Storm Water Management Facilities (SWMFs). The Environmental Services Department is responsible for the inspection of SWMFs and utilizes the online municipal databases to store inspection data. Continued maintenance, functionality and structural integrity are the two main focuses on the inspections, and any faults are forwarded to the Stormwater Engineer. The Environmental Services Department has received registered training and certification from NC State and NPDES non profit agencies. The certifications are updated every three years and are considered the most respected in the field.

3.4 Illicit Discharge Screening

The current MS4 permit requires screening for illicit discharges to suspected waterways on an annual basis. Test sites are determined by study results of commercial, industrial, and residential impacts to the watersheds that flow to the Chesapeake Bay.

- See Appendix D

3.5 Emergency Response Assistance

The Environmental Services Department is designated as First Responders. First Responders is a selected group of employees which during and after major weather events relay information to management about clean-up efforts and are responsible for clearing major blockages for emergency vehicles.

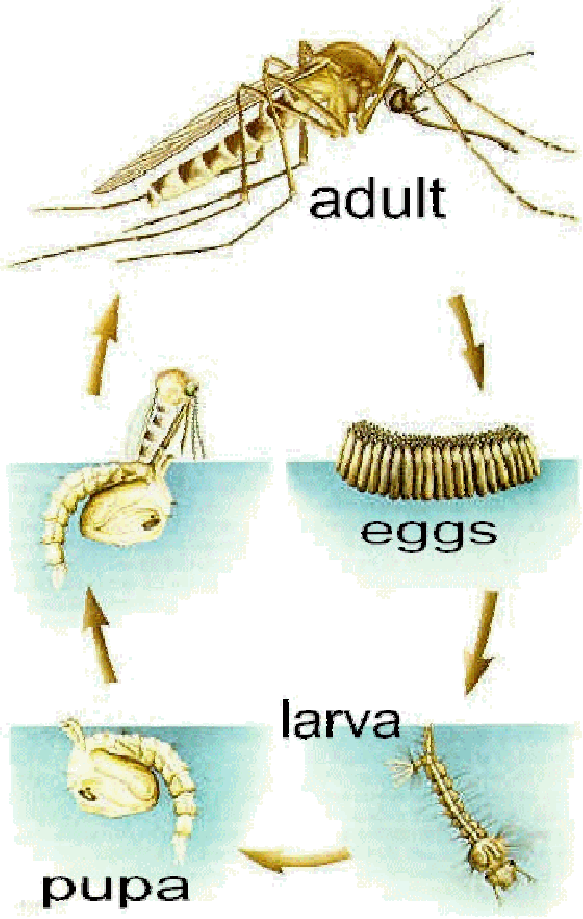
4 – Pest Control Operations

4.1 Integrated Mosquito Management Plan

Hampton has a variety of environments conducive to the mosquito lifecycle. Salt marshes, woodlands, and urbanized areas are all suitable habitats where excessive mosquito populations create nuisance and public health concerns.

Environmental Services utilizes an Integrated Mosquito Management Plan, which entails a variety of methods to reduce or eliminate mosquito populations. Pest tolerance thresholds are defined, populations are determined and the appropriate controls are put in place.

Mosquito Life Cycle



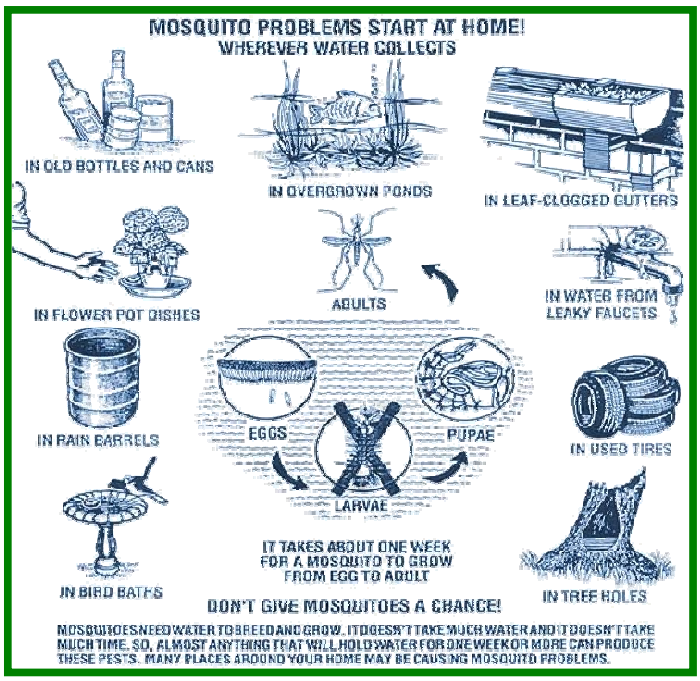
4.1 Integrated Mosquito Management Plan (cont.)

A. Public Education and Notification

The Environmental Services department engages public interaction by being present at city events, civic group meetings, local school programs and by going out into problematic areas to distribute educational information to the residents impacted. Press releases inform large groups when a regional event occurs, and citizens with specialized health concerns, beekeepers and local organic farmers are contacted personally by phone prior to pesticide applications. Any citizen requiring special notification should contact the 311 call center and give contact information.

B. Source Reduction

Environmental Services undertakes various drainage projects throughout the year to eliminate mosquito breeding habitats in low-lying areas. Educational literature is distributed to encourage citizens to participate in source reduction by removing opportunities for casual water sources that become mosquito breeding grounds on their own properties.



4.1 Integrated Mosquito Management Plan (cont.)

C. Surveillance and Arboviral Testing

The Department of Environmental Services integrates the use of various surveillance traps into the Mosquito Management Plan to determine population levels, isolate various vector species and provide a specimen panel for disease monitoring.

Trapping

CDC Light Traps are designed to give a broad overview of the mosquito population in an area. The traps are strategically located throughout Hampton, and are used to catch both bridge vectors and primary vectors of Eastern Equine Encephalitis (EEE) and West Nile Virus (WNV).

Gravid Traps are designed to give a localized view of the urban mosquito population and have been designed to catch the primary vector of West Nile Virus.

Testing

Arboviral testing is done by the Environmental Services Biologist using the VecTest system, which detects the presence of WNV and EEE in a sample mosquito population. Species which may carry or transmit either virus are collected, identified, counted and then tested. Positive results are directed to the Pennsylvania Department of Environmental Protection, or another state accredited lab for confirmation. Testing procedures and regulations are discussed and agreed upon within the regional organization known as the Tidewater Regional Arboviral Surveillance Team (TRAST).

4.1 Integrated Mosquito Management Plan (cont.)

D. Biological Control

There are a number of natural predators of mosquitoes in the Hampton Roads area. Many have been promoted as an asset to mosquito nuisance problems. Indigenous fish, predacious insects, amphibians, and airborne vertebrates account for an irreplaceable amount of control when allowed to work synergistically with other IPM practices. Encouraging the installation of purple martin and bat houses, as well as the use of fish in home ponds add to many residential mosquito control efforts. Currently, the Environmental Services Department is conducting a Biomonitoring program which will document which types of predacious fauna are present throughout the Hampton area.

Due to economical reasons the Environmental Services Department does not house live biological controls sources, but fully endorses and utilizes wild native bio-rational controls.

4.1 Integrated Mosquito Management Plan (cont.)

E. Larval Mosquito Control

Larval surveillance is extremely important before control can be done. Mosquito species can vary significantly in breeding habitats and seasonal activity. Identifying the mosquito larva species as well as larval stages will allow our technicians know which larvicides should be applied and when they are the most effective.

Use of bio-larvicides is a common practice in today's mosquito management programs. These larvicides are completely harmless to the environment, are mosquito and black fly specific, and are made of naturally occurring bacteria.

When bio-larvicides are not able to be utilized, technicians

Our Environmental Services technicians are trained throughout the year on the latest approaches and techniques, and are all certified by the state regulating body Virginia Department of Agriculture and Consumer Services (VDACS).

4.1 Integrated Mosquito Management Plan (cont.)

F. Adult Mosquito Control

Adult mosquito control is employed when established population thresholds have been exceeded for nuisance or potential disease-carrying mosquito species. Threshold limits are derived through surveillance counts, positive arboviral testing results, or unusually high 311 requests in a given area.

Ultra Low Volume (ULV) truck-mounted sprayers are used to disperse insecticide by atomizing liquid particles, so that larger beneficial insects are not affected by the spray. Citizens are notified of pending spray applications and the Mosquito Control Hotline is updated with application scheduling.

Citizens with special notification needs, such as beekeepers, organic farmers, and allergy sensitive citizens are notified when there area is targeted for adult mosquito control.

Currently, the City of Hampton utilizes an independent contractor to handle the aerial spray flights when warranted. This contractor uses the latest technology to track and deliver an aerial application at precise times to reduce the chance of off-target species (i.e. bees, dragonflies, and other beneficial insects) and increase effectiveness in reducing mosquito populations.

4.2 Aquatic Herbicide Management Plan

The Department of Environmental Services assists the Stormwater Operations Division of Public Works in removing organic and inorganic debris from the drainage ditches in Hampton. A number of aquatic plants thrive in our area, and if left unchecked can obstruct drainage areas and cause flooding to nearby neighborhoods. An Integrated Pest Management approach is utilized to minimize impact to non-target organisms and water quality and to offer maximum cost effectiveness.

A. Municipality Owned Ditches

There are currently more than 194 miles of open ditch lines in the City of Hampton. Manual vegetative control is performed Stormwater Drainage Crews. At times where mechanical control is not safe or ineffective, aquatic herbicide applications are used to facilitate proper drainage flow. Aquatic herbiciding may also be utilized when exotic or invasive vegetation is found.

B. SWMF Herbiciding Applications

Multiple Storm Water Management Facilities (SWMFs) are currently being used in the City of Hampton for improving water quality. There are currently several municipally owned SWMFs that we reserve the right to apply herbicides if necessary. A few examples of SWMFs are retention ponds, detention ponds, and general infiltration practices.

When implementing and utilizing an Integrated Pest Management (IPM) program, other avenues are addressed before herbicide applications are done. Preventive measures and cultural or mechanical control are always exhausted before the use of an aquatic herbicide. Excessive growth of invasive species such as phragmites, exotic algal blooms and cattails, grow rapidly and can obstruct inlets and outlets preventing the functionality of SWMFs. These are the types of areas which are prime candidates for herbicide applications.

4.2 Aquatic Herbicide Management Plan (cont.)

C. Assisting Stormwater Operations

The Department of Environmental Services consults with the Stormwater Operations Division pertaining to plant management with the goal of minimizing the usage of aquatic herbicides and labor. The Environmental Services Manager advises the Stormwater Superintendant on advantageous grasses and plants which are conducive to Stormwater runoff and erosion resistance.

D. Preventative Maintenance around Public Works

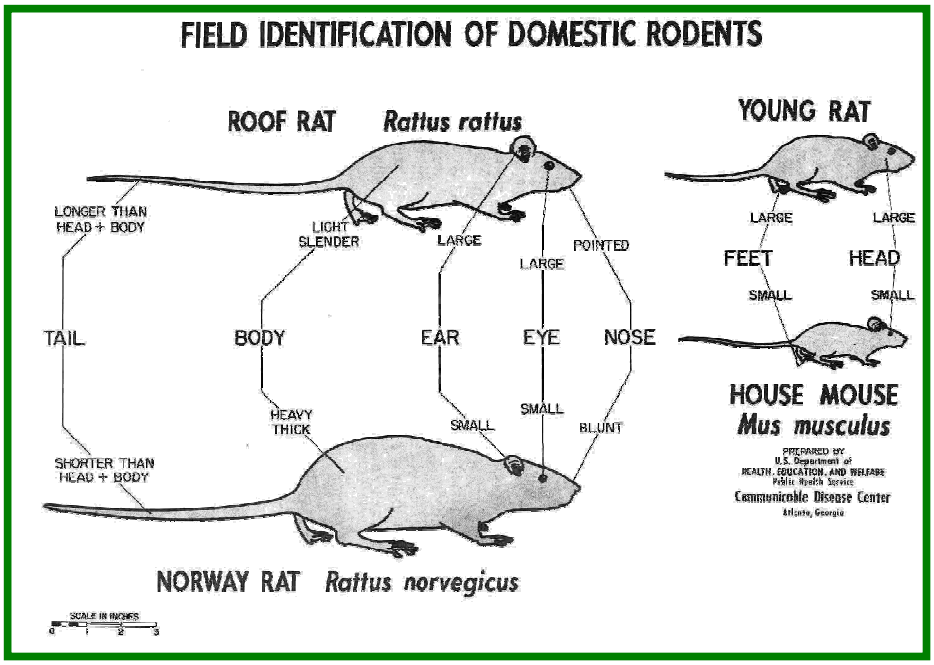
The Department of Environmental Services is tasked with herbicide applications to parking lots and surrounding beds in order to maintain aesthetic and structural integrity around the Public Works compounds at 419 N. Armistead Avenue and 701 Back River Road.

4.3 Rodent Control Operations

The Department of Environmental Services is tasked with eliminating rodent harborage on city owned right-of-ways, and advising citizens with rodent complaints in the city.

Education is the key in this program, as rodent activity can be abundant in certain areas of the city. Removing sources of food, water and harborage will eliminate most rodent problems quickly. Raising constructed outdoor building by four inches will deter most rodents from burrowing in backyards or empty lots.

If rodent activity is found on city property, the Department of Environmental Services will conduct a thorough visual inspection, and treat if necessary.

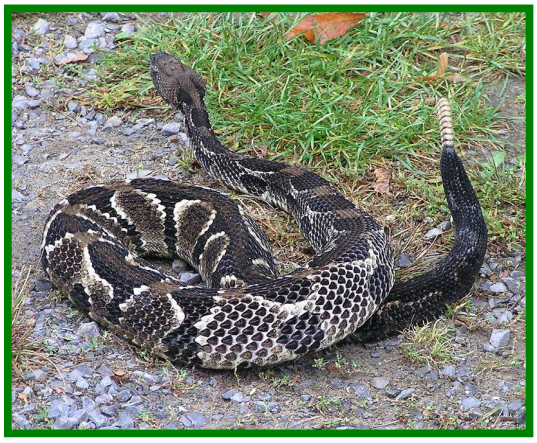


Muskrats and **Nutria** are indigenous in this area, and are a furbearing species. No control is done in the City of Hampton for Muskrats or Nutria, but information on control options are given if a citizen is experiencing a problem. In most cases, citizens are directed to the Virginia Department of Game and Inland Fisheries to ask for assistance or local trapper information.

4.4 General Pest Control

The Department of Environmental Services utilizes a General Pest Control Program to address other potential vertebrate and invertebrate pest problems that originate from municipally owned properties. Citizen requests pertaining to other insects, spiders, snakes and animal pests can be relayed through the 311 call center for assessment.

Wasps, hornets, and bee species are plant pollinators and can provide excellent bio-rational control for certain insect pests while benefitting the environment, but unfortunately, they also can pose significant health issues if located in residential areas and left unchecked. This department's goal on bees, wasps, and hornets is to protect unless the population threatens human safety. Through requests from the 311 call center, technicians assess the potential situation and make decisions that pertain to human health concerns and environmental benefit.



5 – Newmarket Creek Overview

5.1 Newmarket Creek Project

The Department of Environmental Services is currently responsible for a quarterly inspection of the Newmarket Creek from the Newport News city line to Blue Bird Gap Farm in order to remove obstructions of storm water flow. Hurricanes, North Easters, snow and ice storms and other major weather events can cause tree damage and cause major obstructions in the creek. These blockages prevent and hinder proper flow of Stormwater, which can cause flooding.

Crews utilize electrically motorized boats to observe any obstructions in the creek on a quarterly basis. If any obstructions are noted, the entire team will remove any organic or inorganic debris to ensure storm water flow.

On an annual basis, the entire creek is surveyed, including parts of the creek that run from Blue Bird Gap Farm to the Chesapeake Bay.

5.2 Other Tributaries and Estuaries

During the winter season, the Environmental Services Team will police tributaries and estuaries for inorganic and organic trash and debris that is disadvantageous to storm water flow or that has negative environmental impacts to Hampton's wetlands. Harris Creek, Beach Road, Wythe, and North Hampton have many pertinent watersheds and estuaries that require yearly observation and clearing to assist storm water flow and maintain wetland environments for State and federal compliance.

6 – Stormwater Management Facilities Overview

6.1 Environmental Services Responsibilities

Current MS4 Permit regulations require the City of Hampton to inspect and enforce routine maintenance of public and privately owned Stormwater Management Facilities (SWMFs). There are many different types of SWMFs, each with their own set of required maintenance specifications. Public SWMFs are inspected multiple times throughout the year, and maintenance or repair needs are communicated to the Stormwater Superintendant. Environmental Services also currently inspects more than 300 privately owned SWMFs. All inspections are recorded through a municipally maintained online database. This database is utilized by the Stormwater Engineers to notify property owners of any maintenance or structural repairs that are required for compliance. The Stormwater Engineers are responsible for enforcement when necessary.

6.2 SWMF Types

Retention Basin - The most recognized SWMF, a retention basin holds water between major rain events. A retention basin is designed to receive storm water and slowly releases excessive water after a normal rain event. During major rain events, outlets direct excessive storm water flow to an emergency relief area to avoid flooding. Retention Basins require regular maintenance to perform correctly. Removing trash from risers, drawdown devices, trash racks, and emergency spillways allow the basin to perform properly when a rainfall event occurs.

Detention Basin - Another common SWMF currently utilized in the city is the detention basin. This basin serves to hold storm water immediately after a rain event, then releasing runoff methodically, usually within 2-5 days after the event. Unlike retention basins, the detention basin remains dry between rainfall events. Sediment and trash accumulation, ruts from mowers, and lack of structural maintenance are the most common issues that contradict their functionality.

6.2 SWMF Types (cont.)

Bioretention Basin - As one of the most efficient SWMFs, this type of practice is used when looking for functionality and visual appeal. Designed for removal of pollution and nutrient overload, bioretention basins should be avoided where heavy sediment and inorganic and organic debris accumulations are likely to occur. Bioretention basins are very effective despite their high maintenance necessities.

Underground Vaults - Areas that require SWMFs but are limited in space may choose to use a vaulted SWMF. Stormceptors, Vortechs, and BaySavers are just a few of these devices used in this area. Vaulted SWMF's have limited functionality and are specifically designed to hold trash and sediment runoff from parking lots or other large non-permeable areas, but are not designed to reduce nutrient runoff.

Other SWMF's - There are many other SWMF types, and more options become available each year. Green roofs, Permeable Pavement, Grassy Swales, among others are utilized, each with its own set of maintenance standards. Any need for a SWMF should be reviewed by an Environmental Engineer and Landscape Architect for requirements and type.




6.3 Inspection Protocol

Inspections are based on three main criteria: Functionality, Safety, and Aesthetics. All three criteria intertwine and directly affect the others. A passing inspection entails all three criteria are functionally acceptable.

Functionality

Structures must be intact and maintained in order for the SWMF to properly function. Outfall pipes, riprap weirs, main treatment areas, risers and outlets must be free of organic and inorganic blockages and sediment. Structural repairs, trash and sediment buildup must be cleared regularly. Special emphasis is placed at emergency outfalls, which can lead to receiving waters. They must be kept clean and clear to reduce the risk of pollution to Hampton's watersheds.

Aesthetics

Routine maintenance such as mowing, trimming of ornamental plants, mulching beds and surveying for trash keeps a site aesthetically pleasing. Maintaining site aesthetics also reduces the chance of unwanted loitering and animal harborage which directly correlates with safety. More importantly, achieving a clean and well-kept site improves SWMF functionality which is the main goal of any storm water basin.

Safety

If site plans call for a security fence, ditch banks have become eroded, or stoppages are creating a drowning hazard, the SWMF is in violation. Removing safety hazards can positively affect aesthetics and functionality.

6.4 Violations

Any suggestions or violations are sent to the Stormwater Engineer at City Hall. Recommendations are given to the property owners and a time is given to accomplish goals set forth.

7 – Illicit Discharge Overview

7.1 Environmental Services Responsibilities

Current MS4 Permit regulations require the City of Hampton to screen for discharges of pollutants into the waterways on an annual basis. There are currently ninety-six locations on a rotation of three years which were chosen to represent areas that are highly susceptible to industrial, residential and commercial pollutants. Observations of possible illicit discharge sites outside of the routine schedule may be tested throughout the year.

7.2 Screening Procedures

The Department of Environmental Services currently screens for four pollutants (Copper, Chlorine, Detergents, and Phenols) and records both the pH of the sample, and the temperature. These six features will allow the inspection crew to determine if the sample is contaminated. A trained inspection crew is sent out with testing kits, personal protective equipment, a list of sites chosen in the current rotation, and the Dry Weather Screening Manual.

- See Appendix D

Before an inspection is done, the weather is recorded to make sure that environmental factors cannot be confused with an illicit discharge. If no flow is observed upon arriving at the site, the structural condition is noted, and the crew moves on to the next site. If flow is observed, a test is done to determine if the source is tidal or not. If the salinity test is negative, the dry weather screening is started.

7.3 QA/QC Procedures

As a safeguard measure for quality assurance, a representative sample of 10% of the positive screening samples is transported to the Hampton Roads Sanitation District (HRSD) to be analyzed. These tests are done to assure that the equipment and tests utilized are in proper working condition.

7.4 Positive Screening Procedures

Illicit Discharge Screening is conducted at major storm water outfalls at least 48 hours after rain events. Any samples that show levels above the set threshold are considered positive and must be investigated. These investigations are conducted by the Environmental Services technicians and the Biologist. In severe cases, there may be a joint investigation with the Public Works Stormwater Engineer. Storm Drain or "Trunk" investigations narrow the source of a pollutant to a single segment of a storm sewer. Tracking the source of the pollutant and eliminating the source is the main goal. Illicit Discharge to Hamptons Storm Water system can lead to financial responsibility for source removal and falls on the property owners and/or the MS4 operators. Methods for eliminating illicit discharges usually involve a combination of education and enforcement.

8 – Emergency Response Overview

All employees of the Department of Environmental Services are considered as First-Responders. This requires employees to assist other divisions when there are major weather events. Events such as hurricanes and snow storms limit emergency vehicle access to the public. First-Responders are brought in during such an emergency to assist in clearing major arteries in the City, and also assist in clearing many blockages in drainage ways to prevent or reduce the risk of flooding.